TWM4™

MICRO MODULE TRANSMITTER

USER MANUAL **3**

20246/20080220 • TWM4™ Micro module transmitter
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SAFETY WARNINGS

• The wiring of your electrical installation is live (230 V) and extremely dangerous. Never connect the module when plugged into the mains. Always turn off the main switch before starting the installation.
• This product is for professional use and should be installed by a certified installer.
• To prevent short circuits, this product should only be used inside and only in dry spaces. Do not expose the components to rain or moisture. Do not use the product close to a bath, swimming pool etc.
• Do not expose the components of your systems to extremely high temperatures or bright light sources.
• In case of improper usage or if you have altered and repaired the product yourself, all guarantees expire. Marmitek does not accept responsibility in the case of improper usage of the product or when the product is used for purposes other than specified. Marmitek does not accept responsibility for additional damage other than covered by the legal product responsibility.
• This product is not a toy. Keep out of reach of children.
• Do not open the product: the device may contain live parts. The product should only be repaired or serviced by a qualified expert.
• Only connect the adapter to the mains after checking whether the mains voltage is the same as the values on the identification tags. Never connect an adapter when it is damaged. In that case, contact your supplier.
• Automatic switching devices provide comfort, but can also be dangerous. They can surprise people or can ignite clothing hanging over an electric heat source. Please be careful and take appropriate measures to avoid accidents.

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HOW DOES MARMITEK X-10 WORK?

Marmitek X-10 components use the existing mains wiring to communicate (using Marmitek X-10 signals). You can build a complete system using the three different kind of components of the Marmitek X-10 System:

1. Modules: These components will receive Marmitek X-10 signals and will switch or dim the attached lamp or appliance. Examples of these modules are lamp modules and appliance modules. These are available as build-in, micro, DIN rail and plug-in modules.

2. Controllers: These components will transmit Marmitek X-10 signals and thus will control the Modules.

3. Transmitters: Wireless components like remotes. The signals of these components will be received by a controller with transceiver functionality (IRRF 7243, TM13 or CM15Pro).
The Transceiver will translate the signals into Marmitek X-10 signals on the power line.

ADRESSES

Up to a maximum of 256 different addresses can be preset. These are subdivided into a so-called HouseCode (A to P incl.) and a UnitCode (1 to 16 incl.). The HouseCode can also be set on the controllers, so that the controllers and modules become part of the same system. The address can be set either using code dials or by pressing buttons, depending on the type of module.
The Marmitek X-10 System uses standard commands, which control all units with the same HouseCode at the same time (e.g. all lights on, all off, etc.).

SIGNAL RANGE

Range of Marmitek X-10 signals over the Power Line and how to increase the range.

The Marmitek X-10 System is based on power line communication. The range of the Marmitek X-10 signals very much depends on the local circumstances. On average the range is a cable length of 80 meters.

If you have difficulties with the range of your Marmitek X-10 signals, please pay attention to the following facts:

1. When several phases are used in the house, it can be necessary to couple these phases for Marmitek X-10 signals. You can couple them with the use of a CAT 3000 active 3 phase coupler/repeater (Art.No. 09304) and it is required

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if wall outlets and lighting points are actually divided into several phases (several groups is no problem for the Marmitek X-10 signal).

2. It is possible that Marmitek X-10 signals are attenuated by devices and lights which are connected to the power line. In a normal home situation this effect is negligible (the Marmitek X-10 system is using active gain control to eliminate the effects). However, it is possible that a particular device in your house is attenuating the signals so much that the range of Marmitek X-10 signals is decreased significantly. When you have range problems, it is wise to try to locate the device which is attenuating the signals simply by unplugging devices from the power line, and testing the differences in range for your Marmitek system. When e.g. your conclusion is that e.g. your computer monitor is attenuating the signal, you can use a FM10 Plug-in Filter between the power line and the monitor to eliminate the effects.

Known devices which can cause attenuation are:
PC Monitors
PCs with heavy internal power supplies
Old Televisions
Copiers
Fluorescent Lights
Gas Discharge Lamps (Energy Saving Lamps)

3. Some (old) devices are able to disturb the signal by transmitting noise on the power line. Because the Marmitek X-10 signals are transmitted on 120 kHz, only noise on or near this frequency will have influence on the range. When you use a FM10 Filter to connect this device to the power line, the noise will be filtered.

4. The Marmitek X-10 protocol has several mechanism to avoid modules to be switched on or off by other sources than your Marmitek X-10 Controllers. However, it is possible that the Marmitek X-10 signals are disturbed by e.g. baby phones which are in TALK mode (continuous transmission). When these kind of signals are present on the power line it is possible that the Marmitek X-10 signals will not come through.

5. The mains do not stop at the front door of your home. Everything that is attached to mains nearby your home can have influence on Marmitek X-10 signals (e.g. heavy machinery). If you think that your system is influenced by devices out of your house, it is advisable to install FD10 Phase Coupler/Filter

on each phase entering the house. These filters will block signals coming into or going out of your house, but will also match the impedance for the mains. Hereby make your house Marmitek X-10 compatible for these units. To couple the phases use a CAT 3000, see point 1 above.

INTRODUCTION

Congratulations on purchasing the Marmitek Micro module transmitter for installation behind (rocker) switches or Momentary switches. Suitable for controlling various Marmitek modules (actuators) through X-10 commands. The TWM4 can also be used behind a (rocker) switch or Momentary switch to start programming macros in, for example, a Marmitek CM15Pro Computer Interface.

Note: Marmitek build-in modules should always be installed in a back box. Due to heat generation, apply no more than one module per back box!

Note: Inputs are only suitable for potential-free switches or contacts <+5 volts with respect to Neutral.

FUNCTIONS

- Can send ON, OFF, DIM, BRIGHT, All Lights On, All Units Off or All Lights Off commands (depending on the programming).
- Adjustable for fixed mode or toggle mode sending of ON/OFF commands.
- The dimmer interface is adjustable for use with Momentary switches with one or two, normally open contacts (optionally with zero position, multi-switch).
- Adjustable for automatic request for status information (two-way communication, status request).
- Adjustable for receipt of group commands for a status update in toggle mode.

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CONNECTION APPLICATIONS

Suitable for the connection of:

- Four 1-pole (rocker) switches.
- Four 1-pole, normally open contact, Momentary switches.
- Two Momentary switches with two normally open contacts (optionally with zero position, multi-switch).
- One Momentary switch with four normally open contacts (optionally with zero position, multi-switch).
- Four random potential-free contacts with a common contact (P contact).

Connecting wires- colour code for standard programming
The input wires are given an address and function that depends on the programmed address and function. Please see the programming chapter for the colour coding.

Please note: The blue input wire of the TWM4 is connected internally to the neutral terminal. Make sure that the phase and neutral connections are correctly connected to the module. If phase and neutral are swapped, there will be 230 V on the input wires of the module.

Legend for the connecting wires

Installation wires:
= Brown (L or Phase)
= Blue (N of Neutral)
= Black (Switch wire)

Input wires:
= Blue (Marmitek module common wire)
= Brown (Marmitek module Input wire 1)
= Red (Marmitek module Input wire 2)
= Orange (Marmitek module Input wire 3)
= Yellow (Marmitek module Input wire 4)

Installation/assembly behind switches & Momentary switches
Always switch off the power before commencing installation!

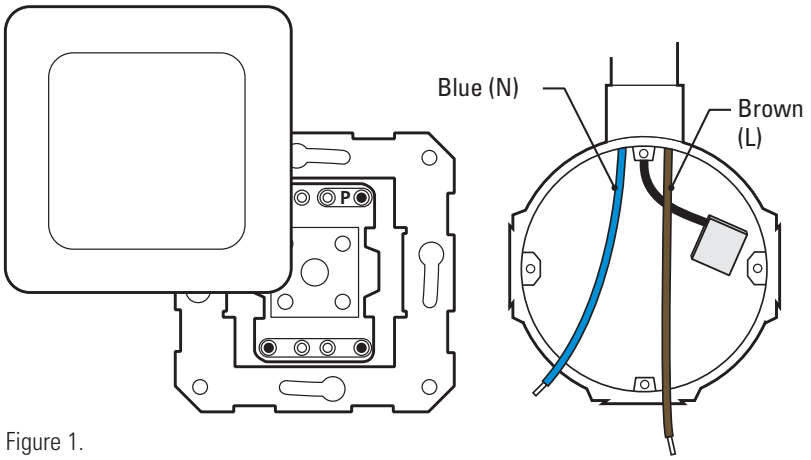

Figure 1.

- When present take the switch from the back box.
- Disconnect the wiring from the switch.
- Put in a neutral wire (N) if it is missing.

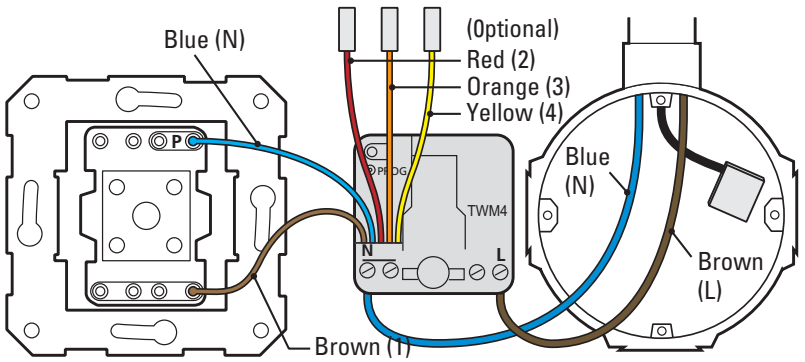

Figure 2.

- Connect the phase wire (L) to the L connection of the module and the neutral wire (N) to one of the neutral connections (N).
- Connect one or more of the module's input wires to the switch contact of the switch. This depends on the application. The input wires that are not connected must be insulated. Connect the blue input wire of the module to the P terminal of the switch.

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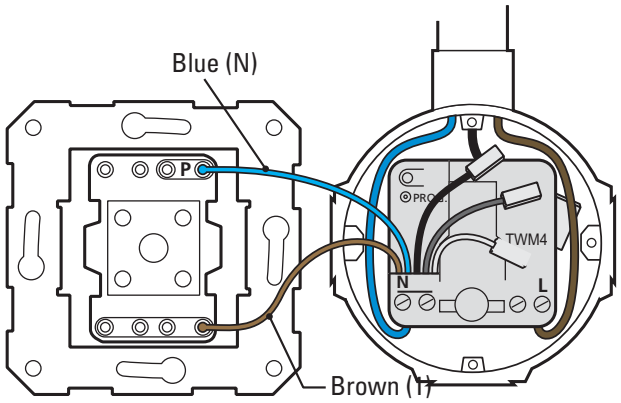
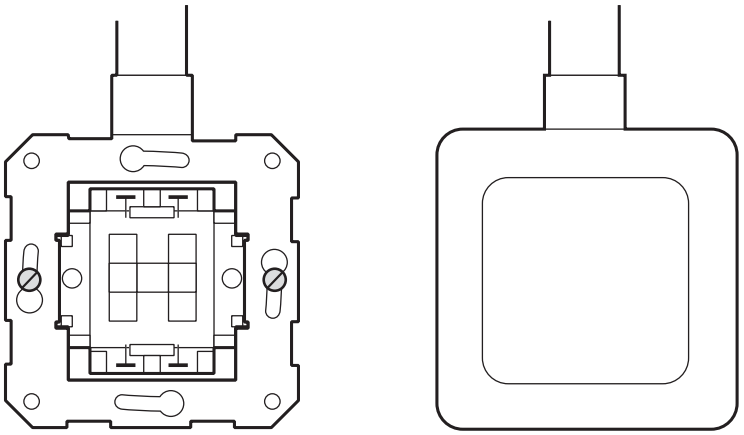


Figure 3.

- Position the module with the back against the rear of the back box, behind the wiring.
- If the module has not yet been programmed or has been incorrectly programmed, then it can now be programmed.

→ **Please see the chapter on programming.**



- After programming, place the switch back in the back box and click the push button with the cover frame back on the switch.

PROGRAMMING

Introduction
Switch on the power supply before you start programming.
Avoid touching live parts!

The introduction to this chapter describes the basic programming actions.

Programming per function
When programming per function, one function/operation is determined for the module and one address is determined, after which the other inputs are automatically given the same function (or a variant of this function) and consecutive addresses.

Basic programming actions

Module programming consists of six steps that must always be performed in the specified order. To program the interface module proceed as follows:

1. Set the module in to Programming mode.
2. Program the address twice.
3. Program a function code twice.
4. Program any options twice.
5. Exit the Programming mode.
6. Test the operation of all the inputs.

Please note: If, immediately after putting the module in Programming mode, an address is sent twice, the module will return to the default value for function and options (On/Off switch commands)!

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1. Switch the module to Programming mode

In order to program the interface module, it must be set in to the Programming mode as follows:

- Press the programming button for at least three seconds (see Figure 5). The red LED will light up and stay on after releasing the button.

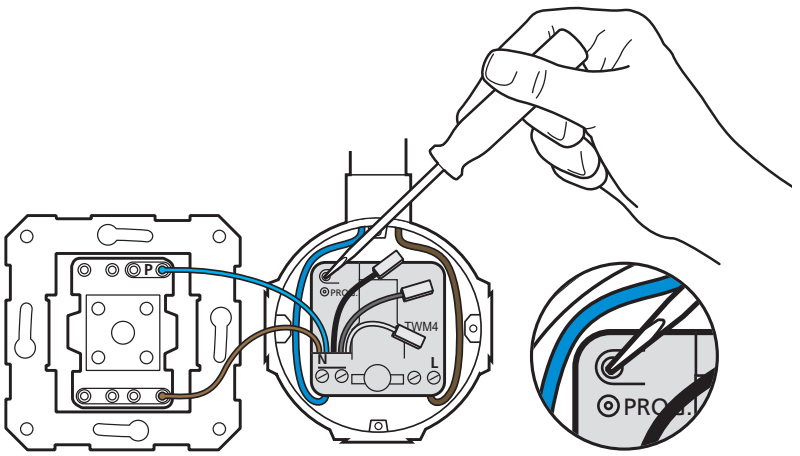

Figure 5. Activating and deactivating the Programming mode.

2. Programming the address

Send the set-up command (letter and figure code) that belongs to the desired address twice via the power line using a programming unit (PRU256) or another X-10-compatible transmitter (e.g. a Marmitek remote control). The LED will flash twice after two identical set-up commands (addresses) have been received.

Standard	Optional	Setup command	No. of LED flashes
Address A1	A2...P16	Address 2 x	2 x

After sending the address, the other inputs will automatically be assigned consecutive addresses.

3. Programming a function code

Determine the function of the module by sending the set-up command belonging to the function twice via the power line (see following table).
The LED responds with a number of flashes according to the selected function once two identical set-up commands have been received.

Function (sending)		Setup command	No. of LED flashes
3.1	On/Off switch commands (switch or pushbutton switch)	ON	3x
3.2	Dimming commands via 1-pole, normally open, contact Momentary switch	BRIGHT	5x
3.3	Dimming commands via momentary switch with two normally open contacts	DIM	6x
3.4	Group commands	All Lights ON	8x

The programming per function chapter explains how to program the above functions with helpful examples.

4. Programming options

The TWM4 has the option of converting the internal status (from ON to OFF or from OFF to ON) upon receiving a group command: All Lights On, All Lights Off, All Units Off.
This option is only applicable with the following functions:
A. Sending On/Off switch commands with switch or with 1-pole, normally open contact, Momentary switch.
B. Sending dimming commands with 1-pole, normally open contact, Momentary switch.

The application of this option depends on how the TWM4 is used. If the TWM4 controls a switch actuator that responds to a group command, the options of the TWM4 will also have to respond to the same group commands. As a result, the status of the interface (TWM4) will always be synch with the switch actuator.

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Example
A switch actuator is controlled using a TWM4, operated with a (rocker) switch. The switch actuator responds to the group commands All Lights On and All Units Off. If the interface module sends an ON command, the switch actuator will switch on. When the switch of the TWM4 is pressed afterwards, the module would normally give an OFF command. However, if the actuator is switched off by an All Units Off group command, the TWM4 must change its internal status accordingly, so that an ON command is sent when the button is next pressed.
If you wish to set one or more options, the following actions should be taken:

- Send the desired command twice from "Set-up command" using the PRU256 programming unit or another X-10-compatible transmitter (such as a remote control).
- The programming LED confirms the "Set-up command" with a specific number of flashes.
- Exit Programming mode.

Option to be set	Setup command	No. of LED flashes
Must respond to All Units Off	All Units OFF	4x
Must respond to All Lights On	All Lights ON	2x
Must respond to All Lights Off	All Lights OFF	3x

5. Exit the Programming mode

- Briefly press the programming button once; The red LED should now be off, or wait 60 seconds and the Programming mode will automatically be switched off..

Please note:
If no set-up command has been received within 60 seconds, the module will automatically exit the Programming mode.

6. Test the operation of all the inputs

Programming per function

This chapter explains the actions that need to be performed to program the module on the basis of function. See 3. Programming a function code for the functions.

3.1 Sending On/Off switch commands with a (rocker) switch or 1-pole, normally open contact, Momentary switch

Action	Sending
Send an address (2 x)	A1...P16
Send setup command (2 x)	ON
Send setup command for any options (2 x)	All Lights ON, All Lights OFF, All Units OFF

Example of programming on address B03

Action	No. of LED flashes
Send address B03 (2 x)	2 x
Send set-up command ON (2 x)	3 x

Optional:
If the status of the module has to change with group commands All Lights On and All Units Off.

Action	No. of LED flashes
Send All Lights On (2 x)	2 x
Send All Units Off (2 x)	4 x

Result

- ON/OFF function available for all inputs.
- Other inputs are automatically given consecutive addresses..

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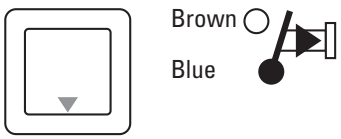
Input	Address	Sending*	Operation
Brown	B03	ON/OFF	Send ON or OFF commands*
Red	B04	ON/OFF	Send ON or OFF commands*
Orange	B05	ON/OFF	Send ON or OFF commands*
Yellow	B06	ON/OFF	Send ON or OFF commands*

* Depends on the status of the switch actuator or address to be controlled (toggle mode).

3.2 Sending dimming commands with 1-pole, normally open contact, Momentary switch



Action	Sending
Send address (2 x)	A1...P16
Send set-up command (2 x)	BRIGHT
Send set-up command for any options (2 x)	All Lights ON, All Lights OFF, All Units OFF

Example of programming on address B03

Action	No. of LED flashes
Send address B03 (2 x)	2 x
Send set-up command BRIGHT (2 x)	5 x

Optional:
If the status of the module has to change with group commands All Lights On and All Units Off.

Action	No. of LED flashes
Send All Lights On (2 x)	2 x
Send All Units Off (2 x)	4 x

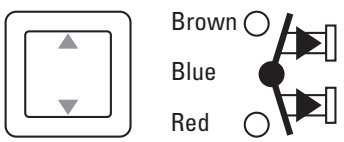
Result

- Dim function available for all inputs.
- Other inputs are automatically given consecutive addresses.

Input	Address	Sending*	Operation
Brown	B03	ON/OFF BRIGHT/ DIM	Short pulse (< 0.5 s) ON or OFF, Long pulse (> 0.5 s) DIM or BRIGHT
Red	B04	ON/OFF BRIGHT/ DIM	Short pulse (< 0.5 s) ON or OFF, Long pulse (> 0.5 s) DIM or BRIGHT
Orange	B05	ON/OFF BRIGHT/ DIM	Short pulse (< 0.5 s) ON or OFF, Long pulse (> 0.5 s) DIM or BRIGHT
Yellow	B06	ON/OFF BRIGHT/ DIM	Short pulse (< 0.5 s) ON or OFF, Long pulse (> 0.5 s) DIM or BRIGHT

- Depends on the status of the switch actuator or address to be controlled (toggle mode).

3.3 Sending dimming commands with Momentary switches with two normally open contacts



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Action	Sending
Send address (2 x)	A1...P16
Send set-up command (2 x)	DIM
Options	None

Example of programming with address B03

Action	No. of LED flashes
Send address B03 (2 x)	2 x
Send set-up command DIM (2 x)	6 x

Result

- Dim function is available on all inputs.
- Other inputs are automatically given consecutive addresses.

Input	Address	Sending	Operation
Brown	B03	ON/BRIGHT	Short pulse (< 0,5 s) ON, long pulse (> 0,5 s) BRIGHT
Red	B03	OFF/DIM	Short pulse (< 0,5 s) OFF, long pulse (> 0,5 s) DIM
Orange	B04	ON/BRIGHT	Short pulse (< 0,5 s) ON, long pulse (> 0,5 s) BRIGHT
Yellow	B04	OFF/DIM	Short pulse (< 0,5 s) OFF, long pulse (> 0,5 s) DIM

3.4 Sending group commands with (rocker) switches or Momentary switches

Action	Sending
Send address (2 x)	A1...P16
Send set-up command (2 x)	All Lights On
Options	None

Example of programming on address B03

Action	No. of LED flashes
Send address B03 (2 x)	2 x
Send set-up command All Lights On (2 x)	8 x

Result

Group commands available on the following inputs.

Input	Address	Sending	Operation
Brown	B	All Lights On	Sends All Lights On using letter code B when switch is pressed
Red	B	All Units Off	Sends All Units Off using letter code B when switch is pressed
Orange	B	All Lights Off	Sends All Lights Off using letter code B when switch is pressed
Yellow	B03	OFF	Sends OFF command when switch is pressed

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FREQUENTLY ASKED QUESTIONS

What is the reason for modules to switch on/off spontaneously?
It is possible that a Marmitek X-10 System is installed at one of your neighbours using the same House Code. To solve this problem try to change the House Code of your system, or have FD10 Phase Coupler/Filter installed at your incoming mains.

My modules will not respond to my controller.
Make sure that the House Code on all Modules and Controllers are set to the same House Code (A .. P).

My modules will not react to my remote / sensor.
When you use a remote or sensor, you should have at least one TM13 Transceiver or Marmitek X-10 Security Console installed in your house. These components will translate the radio signals to the Marmitek X-10 signal on the power line. Using several remotes and sensors, you only need one central transceiver.

Am I able to increase the range of my remotes by using more Transceivers?
Yes, you can use more than one TM13 Transceiver in your home when the range of your remotes is not sufficient. The TM13 is using so called collision detection to prevent signals to be disturbed when more than one TM13 is transmitting. TM13's will wait for a quite power line before transmitting their data. To prevent your Marmitek X-10 System to become slow or to prevent dimming from becoming less smooth, make sure that the TM13 units are placed as far away from each other as possible.

How do I program the TWM4 with my EasyControl8 for instance at address E3 to send dim commands with a 1-pole, normally open contact, momentary switch?
Setup your remote control (see manual 8-in-1) and the TM13 transceiver to house code E.
Start with the MicroModule in setup mode.
- Press the Marmitek X10 button (marked with the symbol of a house) of the 8-in-1 remote control and then press button 3.
- Press the "ON" button 2x (= channel+).
- The MicroModule responds by blinking the LED twice.
- The address E3 is programmed.

• Press the “brt” button 2x (=VOL+).
• The MicroModule responds by blinking the LED 5x.
• Cancel the MicroModule programming mode.

Address B3, B4, B5 and B6 are now programmed to be used with four 1-pole, normally open contact, momentary switches.

Tip: do not press the keys too fast, so the transmitter gets enough time to send the signals to the mains.

Do you still have questions? Please check out www.marmitek.com for more information.

TECHNICAL DATA

Rated voltage	230 VAC +/- 10% , 50 Hz
Current consumption	< 30 mA capacitive
Signal transmission	> 5 Vpp in 5 Ω at 120 kHz
Transmission synchronization	1 pulse burst at 0°/180°
Signal sensitivity	25 mVpp...6 Vpp at 120 kHz ± 4 kHz
Signal/noise ratio	1,35 : 1
X-10 Key codes transmitting	ON, OFF, BRIGHT, DIM, All Lights ON, All Lights OFF, All Units OFF, extended
X-10 Key codes receiving	ON, OFF, BRIGHT, DIM, extended, Status Request
Connection range	Up to 2.5 mm2, tightening torque 0.5 Nm
Ambient temperature	0 °C to 35 °C
Relative humidity	30 tot 90% (non condensing)
Dimensions	46x46x16mm
Minimal back box depth:	40mm, advice 50mm

Environmental Information for Customers in the European Union

European Directive 2002/96/EC requires that the equipment bearing this symbol on the product and/or its packaging must not be disposed of with unsorted municipal waste. The symbol indicates that this product should be disposed of separately from regular household waste streams. It is your responsibility to dispose of this and other electric and electronic equipment via designated collection facilities appointed by the government or local authorities. Correct disposal and recycling will help prevent potential negative consequences to the environment and human health. For more detailed information about the disposal of your old equipment, please contact your local authorities, waste disposal service, or the shop where you purchased the product.

DECLARATION OF CONFORMITY

Hereby, Marmitek BV, declares that this TWM4 is in compliance with the essential requirements and other relevant provisions of the following Directives:

DIRECTIVE 2004/108/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility

Directive 2006/95/EC of the European Parliament and of the Council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits

Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment

Bij deze verklaart Marmitek BV, dat deze TWM4 voldoet aan de essentiële eisen en aan de overige relevante bepalingen van Richtlijnen:

RICHTLIJN 2004/108/EG VAN HET EUROPEES PARLEMENT EN DE RAAD van 15 december 2004 betreffende de onderlinge aanpassing van de wetgevingen van de lidstaten inzake elektromagnetische compatibiliteit

Richtlijn 2006/95/EG van het Europees Parlement en de Raad van 12 december 2006 betreffende de onderlinge aanpassing van de wettelijke voorschriften der lidstaten inzake elektrisch materiaal bestemd voor gebruik binnen bepaalde spanningsgrenzen

Richtlijn 2002/95/EG van het Europees Parlement en de Raad van 27 januari 2003 betreffende beperking van het gebruik van bepaalde gevaarlijke stoffen in elektrische en elektronische apparatuur

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